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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/092,672	03/07/2002	Raymond L. White	EGCRP030	3822

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BEYER WEAVER LLP
P.O. BOX 70250
OAKLAND, CA 94612-0250

EXAMINER	
SIMS, JASON M	
ART UNIT	**PAPER NUMBER**
1631	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/092,672	WHITE ET AL.	
	Examiner	Art Unit	
	Jason M. Sims	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/16/2007 has been entered.

Cancellation of claims 9 and 10 in the response filed 10/16/2007 is acknowledged.

Claims 1-8 are the current claims hereby under examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 and all claims dependent therefrom, at step c, comprise the vague and indefinite word "linking." Claim 1, step c, attempts to define linking by describing it as comprising "determining an incidence of disease by calculating the number and distribution of disease cases within the very large family." It is vague and indefinite as to how determining an incidence of disease within a very large family defines "linking"

the very large family to a disease database. It is unclear as to where in the step of determining an incidence of disease within the very large family establishes a link between the very large family and a disease database. Furthermore, it is unclear as to what role the disease database plays in determining an incidence of disease. Clarification via clearer claim wording is required. For the purposes of the instant application the word "linking" is not being interpreted as being a physical connection such as via a network, but a theoretical link such as where one may use a disease database for referencing and determining diseases that may potentially be studied.

Claim Rejections - 35 USC § 102

Response to Arguments:

Applicant's arguments, filed 10/16/2007, with respect to the rejection of claims under 35 USC 102 have been fully considered and are persuasive because of applicant's arguments and amendments. Therefore the rejection has been withdrawn.

The following is a newly applied rejection:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Evans (US P/N 5,642,936).

The claim is directed to a method of determining relative risk of incidence of disease for a very large family.

Evans teaches claim 7 at col. 1 lines 10-34. Evans discusses using family trees to identify hereditary cancer families and that family histories can be used for detecting patterns of hereditary cancer, which reads on determining the incidence of disease within a large family. Evans further teaches specifically at col. 1, lines 30-34, that gene testing combined with proper management can be used to confirm a risk evaluation, which reads on determining a relative risk of the incidence of the disease within the family.

Evans teaches claim 8 at col. 2, lines 9-11. Evans specifically teaches a method of determining the existence of a hereditary disease risk in a patient, which reads on determining the relative risk of the disease for an individual within a large family.

Claim Rejections - 35 USC § 103

The following is a newly applied rejection:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Palsson (US P/N 6,524,797) in view of Gulcher (1998) and further in view of Gulcher (2001).

The claims are directed to a method of determining the statistical significance of disease incidence comprising selecting at least one founder from a computerized genealogical database, identifying a very large family from the founder in said computerized genealogical database, linking the very large family to a disease database, determining the incidence of disease by calculating which and how many individuals within the very large family have the disease and comparing the incidence of disease in the very large family to a general population incidence of disease and assessing a statistical significance of the disease incidence in the very large family and presenting a measure of said statistical significance on a display or printout.

Palsson at col. 4, lines 59-67 and col. 5, lines 1-10 teaches using a large family for the instant invention. Palsson at col. 5, lines 51-55 and col. 6, lines 6-16 teaches selecting genetically homogeneous populations who have extensive medical and genealogical records, such as the population of Iceland. Therefore, Palsson is teaching using a large family from a homogeneous population wherein the population has extensive medical and genealogical records for use in the taught invention. Palsson at col. 3, lines 64-67 and col. 4, lines 1-5 teaches using a disease database for finding

diseases, i.e. rarer or monogenetic diseases, for use in the invention, which reads on linking the very large family to a disease database. Palsson et al. at col. 4, lines 59-62 and col. 5, lines 1-10 teaches studying the relative risk for each individual within a large family of a genetically homogeneous population and determining the number of normal and diseased individuals and their degree of genetic relatedness using whatever statistical significance is required, which reads on assessing a statistical significance of the disease incidence in the very large family.

Palsson does not explicitly teach selecing at least one founder from a computerized genealogical database and identifying a very large family from the founder in said computerized genealogical database, wherein said very large family comprises a subpopulation of said genealogical database.

Gulcher et al. (1998) at page 526, first column, last 6 lines, and second column, lines 1-5 teaches using a computerized genealogical database for making an extended pedigree from a common founder which includes diseased and non-diseased individuals based on a cohort of affected individuals, which reads on selecting one founder from a computerized genealogical database and using a very large family, wherein the very large family comprises a subpopulation of said genealogical database.

Palsson and Gulcher et al. (1998) do not explicitly teach identifying a very large family from the founder.

However, the use of pedigrees and large families for determining genetic risk factors is a method well known and established in the art. Gulcher et al. (1998) and Palsson both recognize the use of a large family or pedigree for studying and

determining risk factors. Gulcher et al. (1998) at page 535, first column, last paragraph and second column first section, clearly uses a subpopulation within a genealogical database for determining genetic risks. Palsson at col. 4, lines 59-66 teaches the use of a large family for determining genetic risks. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to identify a very large family from the founder in a computerized genealogical database because the differences between the claimed invention and the prior art were encompassed in known variations or in a principal known in the prior art, wherein the principal known in the prior art is using families or pedigrees to determine genetic risks. Therefore, the method step of identifying a very large family from a founder is not an unobvious method step that would produce unpredictable results. Furthermore, Gulcher et. al. (1998), at page 526, second column, paragraphs 2 and 3 teaches the use of such an invention and genetic information maybe for searching for drug targets and to model both disease and host-drug interactions. Palsson teaches an invention directed to identify therapeutic compounds in a genetically defined setting. Therefore, the use of such a database and invention as taught by Gulcher et al. would have been obvious to use in the invention taught by Palsson because the invention of Gulcher et al. clearly provides the genetic setting that could be used by Palsson to identify therapeutic compounds.

Palsson does not explicity teach determining an incidence of disease by calculating the number and distribution of disease cases within the very large family. However, Palsson et al. at col. 4, lines 59-67 and col. 5, lines 1-10 teaches that using

methods known in the art, the degree of relatedness of the individuals within the pedigree, and the relative risk for each individual within the pedigree of exhibiting the disease, can be established, which is based on the number of normal and diseased individuals and their degrees of relatedness within the large family. Therefore it is obvious that the invention of Palsson encompasses a method of determining an incidence of disease by calculating the number and distribution of disease cases within the very large family.

Palsson does not explicitly teach comparing the incidence of disease in the very large family to a general population incidence of disease and assessing a statistical significance of the disease incidence in the very large family.

Gulcher et al. (2001) at page 61, 2nd column, first section, teaches an example of population genomics where the incidence of disease in a very large family is compared to a general population of disease. For example, Gulcher et al. (2001) discusses the risk of siblings of MS patients is less than 2%, but compared with the general population the risk is less than 0.1%.

It would have been obvious to one of ordinary skill in the art to combine the methods taught by Palsson with Gulcher et al. (1998) and Gulcher (2001) because the use of such a database taught and developed by Gulcher (1998 and 2001) et al. would clearly provide the genetic setting that could be used by Palsson to identify therapeutic compounds.

Palsson does not explicitly teach presenting a measure of said statistical significance on a display or printout.

It would be obvious to one of ordinary skill in the art at the time of the instant invention to have output data analysis method results to a display or printout because one of ordinary skill in the art will want to use and assess resulting method steps for use in further analysis and obtaining the results of method steps via a display or printout is an inherent step of performing the analysis itself.

Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palsson (US P/N 6,524,797) in view of Gulcher (1998) and further in view of Gulcher (2001) as applied to claim 1 above.

Palsson teaches limitations of claims 2-4 at col. 4, lines 59-67 and col. 5, lines 1-10 and lines 38-51. Palsson specifically states at col. 4, lines 64-66 the degree of relatedness of the individuals within the pedigree, and the degree of relative risk for each individual within the pedigree of exhibiting the disease can be established, which reads on determining the relative risk of incidence of disease for an individual within the very large family. Furthermore, Palsson states that the relative risk for exhibiting the disease can be determined for each individual within the pedigree and its based on the number of normal and diseased individuals and their degree of genetic relatedness and the statistical significance required. Palsson at col. 4, lines 64-67 teaches obtaining cells from disease individuals within the family, which reads on obtaining DNA samples from individuals with disease and their family within the very large family.

Palsson does not explicitly teach determining the relative risk of incidence of disease for the very large family.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to use the known technique of determining the relative risk of an incidence of disease for an individual and apply it to determining the relative risk of an incidence of disease in a family. The nature of the problem to be solved, which is determining relative risks of incidences of diseases for the family would lead the inventors to look at references relating to the possible solutions to that problem. Therefore, it would have been obvious to apply the method of determining the relative risk of the incidence of disease for the individual for determining it for the family.

Palsson at col. 6, lines 39 teaches some non-limiting examples of how specific populations such as the population of Tristan de Cunha has increased prevalence of asthma and that the Pima Indians have an increased frequency of non-insulin dependent diabetes mellitus. Palsson further states that other genetically homogeneous populations susceptible to particular pathological conditions of interest are known or can be determined by those skilled in the art. Palsson at col. 5, lines 29-33 discusses how in diseases in which a susceptibility locus or gene has been identified, the degree of risk can be associated with the presence of none, one or two alleles of the susceptibility locus or gene.

Palsson does not explicitly teach identifying identity-by-decent regions within the DNA and identifying a susceptibility gene within the identity-by-descent regions.

However, Palsson clearly recognizes genetic aspects of diseases and being able to determine relative risks of diseases, for example, it may be based on the presence of none, one or two alleles of the susceptibility locus or gene. Palsson also clearly

recognizes that some homogeneous populations have specific susceptibility to particular diseases as stated above. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to be able to identify identity-by-descent regions within the DNA samples, given the information of a particular population being susceptible to a particular disease and genetically testing individuals of that population for the particular genes associated with that particular disease, thereby identifying identity-by-decent regions within the DNA samples. The nature of the problem to be solved, which is identifying identity-by-decent regions within the DNA samples, would lead inventors to look at references relating to possible solutions to that problem, such as those in the fields of population genomics or deal with homogenous populations such as the instant Palsson reference. Therefore, it would have been obvious to use the information taught by Palsson of knowing particular homogeneous populations are susceptible to particular diseases, which have a genetic component and use the information to identify an identity-by-decent region within a DNA sample.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Sims, whose telephone number is (571)-272-7540.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Michael Borin can be reached via telephone (571)-272-0713.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the

Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

// Jason Sims //

MICHAEL BORIN, PH.D
PRIMARY EXAMINER